REVISIONS			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Convert to military drawing format, page 2, case Z change from 2150 mW to 1825 mW. Page 5, table I, change V_{OL} test condition I_{OL} from -1 mA to 1 mA. Change code identification number to 67268.	1987 NOV 25	M. A. Frye
B	Add a C-J4 package and change the vendor's part number. Editorial changes throughout.	1990 OCT 15	M. A. Frye

REV																			
SHEET																			
REV	B																		
SHEET	15																		

REV STATUS OF SHEETS															
REV	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	

PMIC N/A

STANDARDIZED MILITARY DRAWING

THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE

AMSC N/A

PREPARED BY
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DRAWING APPROVAL DATE
15 APRIL 1986

REVISION LEVEL
B

DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

MICROCIRCUIT, LINEAR, AC PLASMA DISPLAY DRIVERS, MONOLITHIC SILICON

SIZE	CAGE CODE	
A	**14933**	**86018**

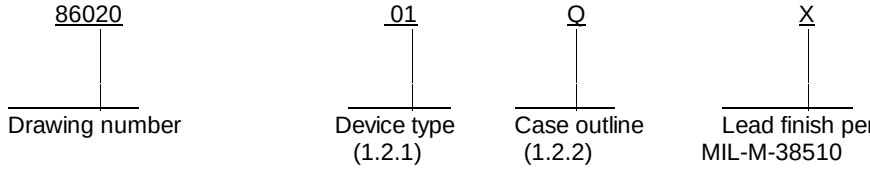
SHEET 1 OF 15

*** US GOVERNMENT PRINTING OFFICE: 1987--748-129/60912**
5962-E1663

1. SCOPE

1.1 Scope. This drawing describes device requirements for class B microcircuits in accordance with 1.2.1 of MIL-STD-883. "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices".

1.2 Part number. The complete part number shall be as shown in the following example:



1.2.1 Device type. The device type shall identify the circuit function as follows:

Device type	Generic number	Circuit
01	55500	AC plasma display driver (line select)
02	55501	AC plasma display driver(matrix-addressable)

1.2.2 Case outlines. The case outlines shall be as designated in appendix C of MIL-M-38510, and as follows:

Outline letter	Case outline
Q	D-5 (40-lead, 2.096" x .620" x .225"), dual-in-line package
X	C-J4 (44-terminal, .662" x .662" x .135"), J-leaded chip carrier package
Z	C-5 (44-terminal, .662" x .662" x .120"), square chip carrier package

1.3 Absolute maximum ratings.

Input voltage	V_{CC1} +0.3 V
Supply voltage (V_{CC1}) 1/	13.8 V
Supply voltage (V_{CC2})	100 V
Storage temperature range	-65°C to +150°C
Continuous total dissipation at (or below) T_A = +25°C:	
Case Q	1650 mW
Cases X and Z	1825 mW
Lead temperature soldering (.0625 inch from case for 60 seconds):	
Case Q	+300°C
Cases X and Z	+260°C
Thermal resistance, junction-to-case (θ_{JC})	See MIL-M-38510, appendix C

1.4 Recommended operating conditions.

Supply voltage (V_{CC1})	10.8 V to 13.2 V
Supply voltage (V_{CC2})	0 V to 100 V
High level input voltage (V_{IH}) as a percentage of V_{CC1}	75% minimum
Low level input voltage (V_{IL}) as a percentage of V_{CC1}	25% maximum
Peak high level output current	-20 mA maximum
Peak low level output current	20 mA maximum
High level output clamp current	20 mA maximum
Low level output clamp current	-20 mA maximum

1/ Voltage values are with respect to network ground terminal.

Clock frequency (f_{clock}) 2/	0 MHz to 8 MHz
Duration of high or low clock pulse (t_W)	62 ns minimum
Setup time (t_{SU}) data inputs before clock low to high	20 ns minimum
Setup time (t_{SU}) select inputs before strobe high to low, device type 01	50 ns minimum
Hold time (t_H), data inputs after clock low to high	50 ns minimum
Hold time (t_H), strobe input after clock low to high, device type 01	50 ns minimum
Hold time (t_H), strobe high hold time after clock high, device type 02	150 ns minimum
Hold time (t_H), select inputs after strobe low to high, device type 01	50 ns minimum
Hold time (t_H), strobe high hold time after sustain high, device type 02	250 ns minimum
Ambient operating temperature range (T_A)	-55°C to +125°C

2. APPLICABLE DOCUMENTS

2.1 Government specification, standard, and bulletin. Unless otherwise specified, the following specification, standard, and bulletin of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this drawing to the extent specified herein.

SPECIFICATION

MILITARY
MIL-M-38510 - Microcircuits, General Specification for.

STANDARD

MILITARY
MIL-STD-883 - Test Methods and Procedures for Microelectronics.

BULLETIN

MILITARY
MIL-BUL-103 - List of Standardized Military Drawings (SMD's).

(Copies of the specification, standard, and bulletin required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing shall take precedence.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices" and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein.

2/ For operation above T_A = +25°C junction temperature (see figure 1).

3.2.1 Terminal connections. The terminal connections shall be as specified on figure 2.

3.2.2 Logic symbols and functional block diagrams. The logic symbols and functional block diagrams shall be as specified on figure 3.

3.2.3 Case outlines. The case outlines shall be in accordance with 1.2.2 herein.

3.2.4 Switching waveforms. Switching waveforms shall be as specified on figure 4.

3.3 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in table I and apply over the full ambient operating temperature range.

3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table II. The elctrical tests for each subgroup are described in table I.

3.5 Marking. Marking shall be in accordance with MIL-STD-883 (see 3.1 herein). The part shall be marked with the part number listed in 1.2 herein. In addition, the manufacturer's part number may also be marked as listed in MIL-BUL-103 (see 6.6 herein).

3.6 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in MIL-BUL-103 (see 6.6 herein). The certificate of compliance submitted to DESC-ECS prior to listing as an approved source of supply shall affirm that the manufacturer's product meets the requirements of MIL-STD-883 (see 3.1 herein) and the requirements herein.

3.7 Certificate of comformance. A certificate of conformance as required in MIL-STD-883 (see 3.1 herein) shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change. Notification of change to DESC-ECS shall be required in accordance with MIL-STD-883 (see 3.1 herein).

3.9 Verification and review. DESC, DESC's agent, and the acquiring activity retain the option to review the manufacturer's facility and applicable required documentation. Offshore documentation shall be made available onshore at the option of the reviewer.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with section 4 of MIL-M-38510 to the extent specified in MIL-STD-883 (see 3.1 herein).

4.2 Screening. Screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection. The following additional criteria shall apply:

a. Burn-in test, method 1015 of MIL-STD-883.

(1) Test condition A, B, C, or D using the circuit submitted with the certificate of compliance (see 3.6 herein).

(2) T_A = +125°C, minimum.

b. Interim and final electrical test parameters shall be as specified in table II herein, except interim electrical parameter tests prior to burn-in are optional at the discretion of the manufacturer.

TABLE I. Electrical performance characteristics for device type 01.

Test	Symbol	Conditions $-55°C \le T_A \le +125°C$ unless otherwise specified		Group A subgroups	Limits		Unit
					Min	Max	
Input clamp voltage	V_{IK}	V_{CC1} = 12 V, I_I = -12 mA		1, 2, 3		-1.5	V
High level output voltage	V_{OH}	V_{CC1} = 13.2 V, V_{CC2} = 100 V	I_{OH} = -1 mA	1, 2, 3	94		V
			I_{OH} = -10 mA		92		
			I_{OH} = -15 mA	1, 2, 3	90		
Low level output voltage	V_{OL}	V_{CC1} = 13.2 V, V_{CC2} = 100 V	I_{OL} = 1 mA	1, 2, 3		2.0	V
			I_{OL} = 10 mA			4.0	
			I_{OL} = 15 mA			5.0	
Output clamp voltage	V_{OK}	V_{CC2} = 0 V	I_O = 20 mA	1, 2, 3		2.5	V
			I_O = -20 mA			-2.5	
High level input current	I_{IH}	V_{CC1} = 13.2 V, $V_I = V_{IH}$ minimum		1, 2, 3		1.0	µA
Low level input current	I_{IL}	V_{CC1} = 13.2 V, $V_I = V_{IL}$ maximum		1, 2, 3		-1.0	µA
Supply current	I_{CC1}	V_{CC1} = 13.2 V	$V_I = V_{CC1}$ max	1, 2, 3		1.0	mA
			V_I = 0			1.0	
Supply current	I_{CC2}	V_{CC2} = 100 V	8 outputs high	1, 2, 3		5.0	mA
			All outputs low			3.0	
Delay time, high to low level output from strobe input	t_{DHL}	C_L = 30 pF V_{CC1} = 12 V, V_{CC2} = 100 V		9		250	ns
				10, 11		350	
Delay time, low to high level output from strobe input	t_{DLH}			9		450	ns
				10, 11		550	

TABLE I. Electrical performance characteristics for device type 01 - Continued.

Test	Symbol	Conditions $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Transition time, high to low level output	t_{THL}	C_L = 30 pF V_{CC1} = 12 V, V_{CC2} = 100 V	9, 10, 11		200	ns
Transition time, low to high level output	t_{TLH}		9, 10, 11		250	ns

TABLE I. Electrical performance characteristics for device type 02.

Test	Symbol	Conditions $-55°C \le T_A \le +125°C$ unless otherwise specified			Group A subgroups	Limits		Unit
						Min	Max	
Input clamp voltage	V_{IK}	V_{CC1} = 12 V, I_I = -12 mA			1, 2, 3		-1.5	V
High level output voltage	V_{OH}	V_{CC1} = 13.2 V V_{CC2} = 100 V	Q outputs	I_{OH} = -1 mA	1, 2, 3	94		V
				I_{OH} = -10 mA		92		
				I_{OH} = -15 mA		90		
		V_{CC1} = 10.8 V V_{CC2} = 100 V	Serial data	I_{OH} = -100 µA		9		
Low level output voltage	V_{OL}	V_{CC1} = 13.2 V V_{CC2} = 100 V	Q outputs	I_{OL} = 1 mA	1, 2, 3		2.0	V
				I_{OL} = 10 mA			4.0	
				I_{OL} = 15 mA			5.0	
		V_{CC1} = 10.8 V V_{CC2} = 100 V	Serial data	I_{OL} = 100 µA			1.0	
Q output clamp voltage	V_{OK}	V_{CC2} = 0 V	I_O = 20 mA		1, 2, 3		2.5	V
			I_O = -20 mA				-2.5	
High level input current	I_{IH}	V_{CC1} = 13.2 V, V_{CC2} = 100 V $V_{IH} = V_{IH}$ minimum			1, 2, 3		1.0	µA

TABLE I. Electrical performance characteristics for device type 02 - Continued.

Test	Symbol	Conditions $-55°C \le T_A \le +125°C$ unless otherwise specified		Group A subgroups	Limits		Unit
					Min	Max	
Low level input current	I_{IL}	V_{CC1} = 13.2 V, V_{CC2} = 100 V $V_{IL} = V_{IL}$ maximum		1, 2, 3		-1.0	µA
Low voltage supply current	I_{CC1}	V_{CC1} = 13.2 V V_{CC2} = 100 V	$V_I = V_{CC1}$	1, 2, 3		1.0	mA
			V_I = GND			1.0	
High voltage supply current	I_{CC2}	V_{CC2} = 100 V	Outputs low	1, 2, 3		1.0	mA
			Outputs high			5.0	
Transition time high to low Q output	t_{THL}	C_L = 30 pF, V_{CC1} = 12 V, V_{CC2} = 100 V		9, 10, 11		200	ns level
Transition time low to high level Q output	t_{TLH}			9, 10, 11		250	ns
Delay time to high to low transition	t_{DHL}	C_L = 30 pF V_{CC1} = 12 V V_{CC2} = 100 V	From strobe to Q outputs	9		250	ns
				10, 11		300	
			From sustain to Q outputs	9		250	
				10, 11		300	
Delay time to low to high	t_{DLH}		From strobe to Q outputs	9		450	ns
				10, 11		650	
			From sustain to Q outputs	9		450	
				10, 11		650	
Delay time to high to low from clock to serial data output	t_{DHL}	C_L = 20 pF V_{CC1} = 12 V V_{CC2} = 100 V		9		147	ns
				10, 11		300	
	t_{DLH}			9		147	ns
				10, 11		300	

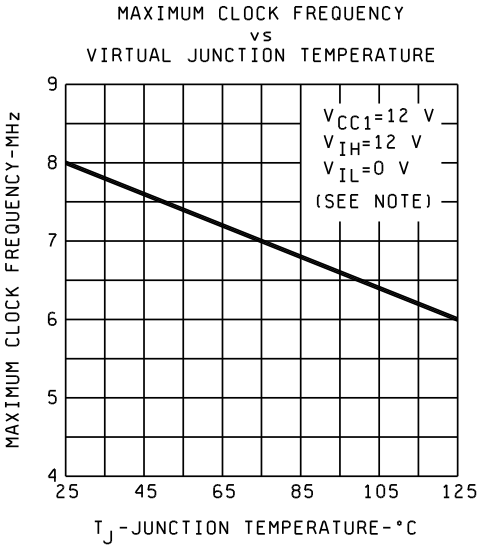
4.3 Quality conformance inspection. Quality conformance inspection shall be in accordance with method 5005 of MIL-STD-883 including groups A, B, C, and D inspections. The following additional criteria shall apply.

4.3.1 Group A inspection.

a. Tests shall be as specified in table II herein.

b. Subgroups 4, 5, 6, 7, and 8 of table I, method 5005 of MIL-STD-883 shall be omitted.

DEVICE TYPES 01 AND 02



NOTE: This curve assumes a symmetrical clock pulse.

FIGURE 1. Clock-frequency to temperature curve.

Device types	01		02	
Case outlines	Q	X and Z	Q	X and Z
Terminal number	Terminal symbol			
1	SO	NC	CLOCK	NC
2	DATA	SO	SUSTAIN	CLOCK
3	CLOCK	DATA	STROBE	SUSTAIN
4	1Q1	CLOCK	Q1	STROBE
5	1Q2	NC	Q2	NC
6	1Q3	1Q1	Q3	Q1
7	1Q4	1Q2	Q4	Q2
8	1Q5	1Q3	Q5	Q3
9	1Q6	1Q4	Q6	Q4
10	1Q7	1Q5	Q7	Q5
11	1Q8	1Q6	Q8	Q6
12	2Q1	1Q7	Q9	Q7
13	2Q2	1Q8	Q10	Q8
14	2Q3	2Q1	Q11	Q9
15	2Q4	2Q2	Q12	Q10
16	2Q5	2Q3	Q13	Q11
17	2Q6	2Q4	Q14	Q12
18	2Q7	2Q5	Q15	Q13
19	2Q8	2Q6	Q16	Q14
20	GND	2Q7	GND	Q15
21	V_{CC2}	2Q8	V_{CC2}	Q16
22	3Q8	GND	Q17	GND
23	3Q7	NC	Q18	NC
24	3Q6	V_{CC2}	Q19	V_{CC2}
25	3Q5	3Q8	Q20	Q17
26	3Q4	3Q7	Q21	Q18
27	3Q3	3Q6	Q22	Q19
28	3Q2	3Q5	Q23	Q20
29	3Q1	3Q4	Q24	Q21
30	4Q8	3Q3	Q25	Q22
31	4Q7	3Q2	Q26	Q23
32	4Q6	3Q1	Q27	Q24
33	4Q5	4Q8	Q28	Q25
34	4Q4	4Q7	Q29	Q26
35	4Q3	4Q6	Q30	Q27
36	4Q2	4Q5	Q31	Q28
37	4Q1	4Q4	Q32	Q29
38	STROBE	4Q3	SERIAL OUT	Q30
39	S1	4Q2	DATA IN	Q31
40	V_{CC1}	4Q1	V_{CC1}	Q32
41	- - -	NC	- - -	NC
42	- - -	STROBE	- - -	SERIALOUT
43	- - -	S1	- - -	DATA IN
44	- - -	V_{CC1}	- - -	V_{CC1}

NC = No connection

FIGURE 2. Terminal connections.

DEVICE TYPE 01

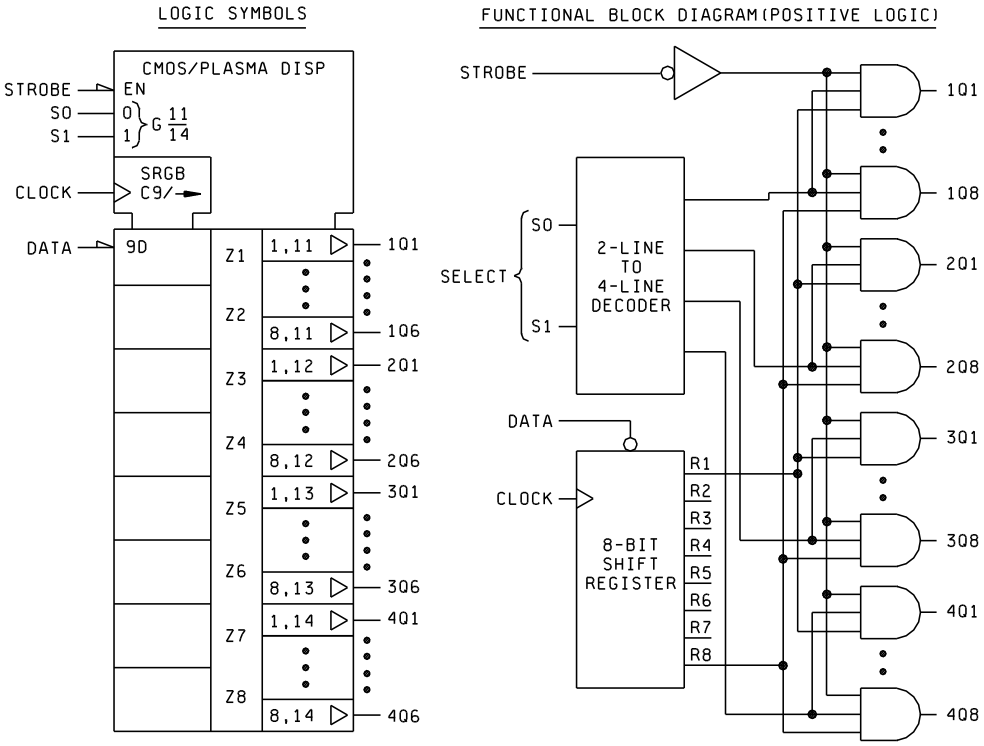


FIGURE 3. Logic symbols and functional block diagrams.

DEVICE TYPE 02

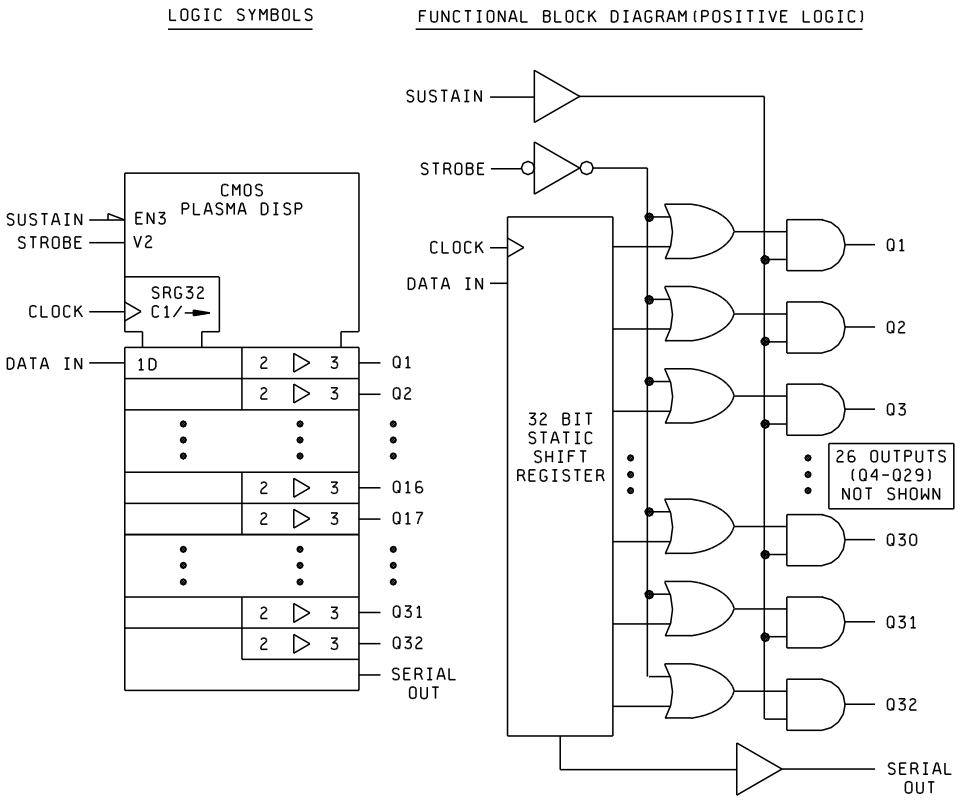


FIGURE 3. Logic symbols and functional block diagrams - Continued.

DEVICE TYPE 01

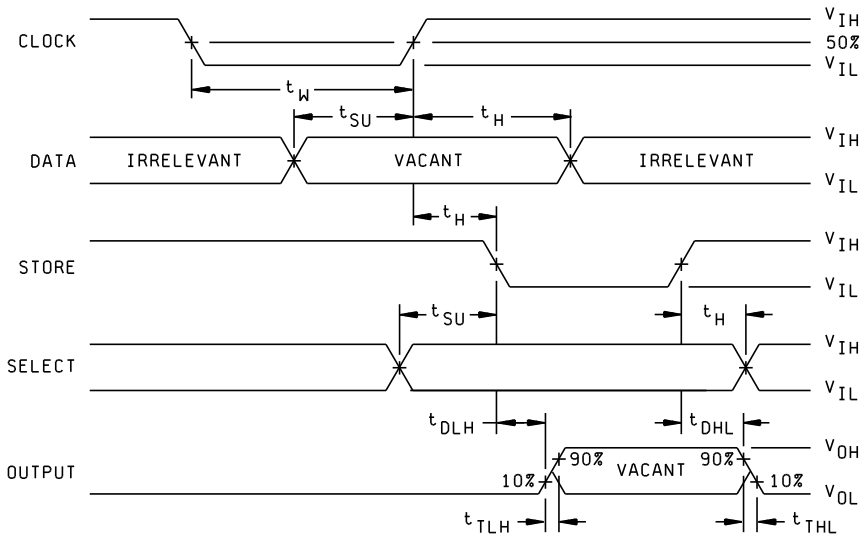
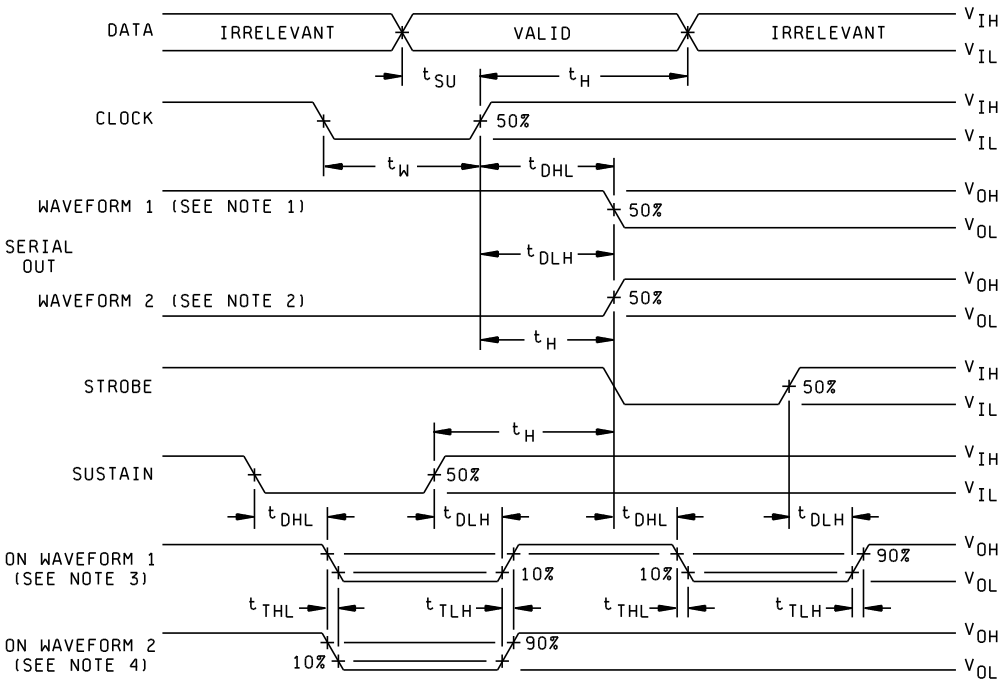


FIGURE 4. Switching waveforms.



NOTES:
1. Serial data out waveform for internal condition such that a logic low is registered in R32.
2. Serial data out waveform for internal conditions such that a logic high is registered in R32.
3. Q_n output with a logic low stored in associated register R_n.
4. Q_n output with a logic high stored in associated register R_n.

FIGURE 4. Switching waveforms - Continued.

TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (per method 5005, table I)
Interim electrical parameters (method 5004)	1
Final electrical test parameters (method 5004)	1*, 2, 3, 9
Group A test requirements (method 5005)	1, 2, 3, 9, 10, 11**
Groups C and D end-point electrical parameters (method 5005)	1, 2, 3

* PDA applies to subgroup 1.
** Subgroups 10 and 11, if not tested, shall be guaranteed to specified limits of table I.

4.3.2 Groups C and D inspections.

a. End-point electrical parameters shall be as specified in table II herein.

b. Steady-state life test conditions, method 1005 of MIL-STD-883.

(1) Test condition A, B, C, or D using the circuit submitted with the certificate of compliance (see 3.6 herein).

(2) T_A = +125° C, minimum.

(3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for OEM application. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-38510, the device specified herein will be inactivated and will not be used for new design. The QPL-38510 product shall be the preferred item for all applications.

6.2 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

6.3 Configuration control of SMD's. All proposed changes to existing SMD's will be coordinated with the users of record for the individual documents. This coordination will be accomplished in accordance with MIL-STD-481 using DD form 1693, Engineering Change Proposal (Short Form).

6.4 Record of users. Military and industrial users shall inform Defense Electronics Supply Center when a system application requires configuration control and the applicable SMD. DESC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of drawings covering microelectronics devices (FSC 5962) should contact DESC-ECS, telephone (513) 296-6022.

6.5 Comments. Comments on this drawing should be directed to DESC-ECS, Dayton, Ohio 45444, or telephone (513) 296-5375.

6.6 Approved source of supply. An approved source of supply is listed in MIL-BUL-103. Additional sources will be added to MIL-BUL-103 as they become available. The vendor listed in MIL-BUL-103 has agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DESC-ECS. The approved source of supply listed below is for information purposes only and is current only to the date of the last action of this document.

Military drawing part number	Vendor CAGE number	Vendor similar part number 1/
8601801QX	01295	SNJ55500EJ
8601801XX	01295	SNJ55500EFJ
8601801ZX	01295	SNJ55500EFD
8601802QX	01295	SNJ55501EJ
8601802XX	01295	SNJ555001EFJ
8601802ZX	01295	SNJ55501EFD

1/ Caution: Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.

Vendor CAGE number	Vendor name and address
01295	Texas Instruments, Incorporated 13500 N. Central Expressway P.O. Box 655303 Dallas, TX 75265 Point of contact: I-20 at FM 1788 Midland, TX 79711-0448